CLAIMS

What is claimed is:

1. A method for fabricating radiation-tolerant integrated circuit devices, said method comprising:

depositing a layer of pad oxide on a semiconductor substrate;

selectively etching said pad oxide layer and said semiconductor substrate to define a trench within said semiconductor substrate; and

implanting boron ions at an angle with respect to normal in said trench.

2. The method according to Claim 1, wherein said boron ions are implanted beneath the bottom of the trench and along the side walls of the trench.

3. The method according to Claim 1, wherein said boron ion implantation is performed with an energy no greater than about 20 KeV.

4. The method according to Claim 1, wherein said boron ion implantation is performed with a dose of boron ions in a range between approximately 10^{10} atoms/cm^2 and 10^{13} atoms/cm^2.

5. The method according to Claim 1, further including the step of implanting a p-type material to form a P-well having a depth greater than the depth of said trench.

6. The method according to Claim 5, further including the step of implanting an electrically neutral material into said substrate.

7. The method according to Claim 6, wherein said electrically neutral material is implanted to a depth which is no greater than the depth of a diffusion region in said P-well.

8. A semiconductor integrated circuit device, comprising:

a semiconductor substrate having a layer of pad oxide and a patterned pad nitride; and

a shallow trench formed within said semiconductor substrate, which includes a implantation region formed by implanting boron ions below the bottom and along the side walls of said shallow trench.

9. The semiconductor integrated circuit device according to Claim 8, further including a P-well having a depth which is greater than the depth of said trench.

10. The semiconductor integrated circuit device according to Claim 9, further including an implantation region of electrically neutral material.

11. The semiconductor integrated circuit device according to Claim 10, wherein said P-well has diffusion regions within it, and said implantation region of electrically neutral material extends to a depth less than the depth of said diffusion regions.

12. The semiconductor integrated circuit device according to Claim 8, wherein said boron ions have a concentration between approximately 10^{10} atoms/cm^2 and 10^{13} atoms/cm^2.